

## CLAIMS

1. An exercise trainer to provide exercise movement to a user comprising:

a first crank arm and a second crank arm oriented at an angular distance from the other;

a first foot link connected to said first crank arm and a second foot link connected to said second crank arm;

foot pedals supported on said foot links for relative movement with respect to said foot links;

a bearing support for said foot links at a point removed from said first and second crank arms to which said first and second foot links are supported for sliding reciprocating movement;

a connection between a grounded point and said foot pedals interconnected with said foot links to provide relative <sup>horiz.</sup> movement (as to the ground) of said foot pedals at least twice the length of each respective crank arm; and,

a seat mounted on said trainer to provide for a user sitting on said trainer and placing the user's feet

on said foot pedals for exercise movement.

2. The exercise trainer as claimed in Claim 1 further comprising:

said connection is of a length to provide a movement of said foot pedals in the outline of a modified ellipse.

3. The exercise trainer as claimed in Claim 1 further comprising:

said connection provides movement of said foot pedals of at least twice the crank length upon 90° of movement of the crank arm and at least four times the distance upon 180° of movement of the crank arm.

4. The exercise trainer as claimed in Claim 1 wherein:

said connection comprises a flexible member connected to said foot link by one or more pulleys around which said flexible member is placed at a point removed from the foot pedal.

5. The exercise trainer as claimed in Claim 1 further comprising:

said first and second crank arms being connected to a

motor for driving said crank arms at a given speed.

6. The exercise trainer as claimed in Claim 5 further comprising:

a controller which limits the speed of said motor to provide a load beyond said speed to the crank arms and connected foot pedals.

7. The exercise trainer as claimed in Claim 5 further comprising

a motor and control for raising and lowering said seat with respect to said foot pedals.

8. An exercise trainer with a leg movement multiplier and a seat comprising:

a base;

first and second crank arms rotationally supported angularly apart on said base;

first and second foot links connected respectively to said first and second crank arms at one end and supported for sliding movement distally from said crank arms;

1 first and second foot pedals respectively supported  
2 for longitudinal movement on said first and second  
3 foot links;

4  
5 a connection between said foot pedals and a ground  
6 connection on said base and interconnected with said  
7 foot links so that said foot links when moved in  
8 supported relationship with said crank arms provide  
9 for a degenerated elliptical movement of said foot  
10 pedals with respect to ground greater than twice the  
11 length of its respective crank arm; and,

12  
13 a seat mounted on said base having a height  
14 adjustment with respect to the foot pedals.

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16 9. The exercise trainer as claimed in Claim 8 further  
17 comprising:

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19 said connection being a flexible member supported on  
20 a pulley to the rearward of said foot pedal and a  
21 pulley forward of said foot pedal.

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23 10. The exercise trainer as claimed in Claim 8 wherein:

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25 said crank arms are connected to a motor for  
26 providing rotational movement of said crank arms.

27  
28 11. The exercise trainer as claimed in Claim 10 further

comprising:

a motor controller for controlling the speed of said motor for positive drive of said pedals and alternatively providing a load on said pedals.

12. An exercise trainer comprising:

a base;

a first and second crank arm angularly apart from each other mounted on said base;

a motor connected to said crank arms for driving said crank arms;

first and second foot links respectively connected to said first and second crank arms;

a bearing surface mounted on said base removed from said connection of said foot links to said crank arms providing reciprocal movement of said foot links;

a foot pedal mounted on each of said foot links having a bearing surface which engages said foot links for reciprocal movement with respect to said foot links;

1 a linkage between said foot pedals and said foot  
2 links;

3  
4 a securement for securing said linkage to a fixed  
5 portion on said base to provide relative movement of  
6 said foot pedals with respect to ground greater than  
7 twice the length of a crank arm, and in a degenerated  
8 elliptical path; and,

9  
10 a seat mounted for movement by a motor up and down  
11 with respect to said foot pedals in order to raise  
12 and lower a user with respect to said foot pedals.

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14 13. The exercise trainer as claimed in Claim 12 further  
15 comprising:

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17 said ~~mechanical~~ linkage comprising a flexible member  
18 connected to said foot pedal and to said foot link;  
19 and,

20  
21 a controller for controlling the speed of said motor  
22 connected to said crank arms and the elevation of  
23 said seat.

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25 14. The exercise trainer as claimed in Claim 12 further  
26 comprising:

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28 a rotational mounting for said seat for causing said

1 seat to turn on its mounting toward the side of said  
2 trainer.

3  
4 15. An exercise trainer comprising:

5 *a base*  
6 a first and second foot link connected and supported  
7 for opposing reciprocal movement;

8  
9 a support for said foot links providing a bearing  
10 surface for reciprocal movement and support so as to  
11 allow said foot links to reciprocate;

12 *slidably*  
13 a first foot pedal mounted on said first foot link  
14 and a second foot pedal *slidably* mounted on said second foot  
15 link;

16  
17 a connecting member connected between said foot link  
18 and said foot pedal;

19 *connecting the base*  
20 a ground connection connected to said connecting  
21 member to assist movement of said foot pedals on said  
22 foot link in a modified elliptical path;

23  
24 a seat mounted on said exerciser for raised and  
25 lowered placement with respect to said pedals; and,

26  
27 a motor for driving said foot pedals.  
28

16. The exercise trainer as claimed in Claim 15 further comprising:

a controller for controlling the movement of said motor to provide a drive or a retarding movement of said foot pedals with respect to a user's movements.

17. The exercise trainer as claimed in Claim 15 further comprising:

a motor connected to said seat having a linkage to raise and lower said seat; and,

a controller for controlling said motor to raise and lower said seat to a desired height.

18. The exercise trainer as claimed in Claim 15 further comprising:

a controller which sets the speed of said motor to provide a given speed of said pedals under positive drive and a retarding force when a user exceeds the given speed.

19. An exercise trainer having a seat comprising:

a first and second crank arm having a common axis supported on a frame with a base, said first and



second crank arm being angularly displaced from each other;

a first foot link and a second foot link respectively supported on said first crank arm and said second crank arm;

a support for supporting said foot links removed from said first and second crank arm supports for reciprocal movement as said cranks are turned;

a first foot pedal on said first foot link and a second foot pedal on said second foot link supported for reciprocal movement on said foot link;

a linkage between said foot pedal and said foot link and a fixed portion of said frame to provide reciprocal movement of said foot pedals through a degenerated ellipse having its major axis greater than the length of the crank arm to which it is supported;

a seat mounted on said exercise trainer having an adjustable seat mounting for moving said seat as to its distance with respect to said first and second foot pedals; and,

a motor connected to said seat for adjusting the

distance of said seat with respect to said pedals.

20. The exercise trainer as claimed in Claim 19 further comprising:

said linkage being formed as a flexible member wrapped at either end around a pulley and connected to said foot link.

21. The exercise trainer as claimed in Claim 20 further comprising:

a controller for controlling the height of said seat.

22. The exercise trainer as claimed in Claim 19 further comprising:

a motor connected to said crank arms; and,

a controller for controlling the speed of said motor.

23. The exercise trainer as claimed in Claim 22 further comprising:

said controller having a control for controlling the speed of said motor at a setpoint to supplement or retard movement by a user.

24.

An exercise trainer having a seat comprising:

a first crank arm and a second crank arm angularly offset from each other connected to a motor for rotational movement;

a first foot link connected to said first crank arm and a second foot link connected to said second crank arm;

a first foot receiving member and a second foot receiving member respectively connected for movement on said first foot link and said second foot link;

a linkage between said first foot link and said foot receiving member interconnecting them, a linkage between said second foot link and said foot receiving member, both of said linkages connected to a ground point so that said foot links when reciprocated cause said foot receiving members to reciprocally move on said foot links in relative displacement with respect to said ground; and,

a controller for controlling the speed of said motor and the attendant speed of said crank arms.

25. The exerciser as claimed in Claim 24 further comprising:

said controller having a circuit for setting the speed of said motor at a given speed of movement for a user, and which can retard the movement of a user above a set speed and supplements the movement of a user below the set speed.

26. The exercise trainer as claimed in Claim 25 wherein:

the controls for said motor and the seat height are on a panel of said exerciser.

27. The exercise trainer as claimed in Claim 26 wherein:

said seat is mounted for pivoting on its axis to the side of said trainer.